

EP 24774 (3)

PATENT SPECIFICATION



719,849

Date of Application and filing Complete

Specification: Sept. 22, 1952.

No. 23727/52.

Application made in Sweden on Sept. 20, 1951.

Complete Specification Published: Dec. 8, 1954.

Index at acceptance:—Classes 38(1), E7B, G2X; and 38(5), B1F(3:7), B2A5X, B2B(1:6).

COMPLETE SPECIFICATION

A Combined Electric Fuse and Contact Breaker

We, DAVID OLOF HAGGLUND, a Swedish Subject of Oskarsgaten 1, Ornskoldsvik, Sweden, and AINE EVERT ERLING JANSSON, a Swedish Subject of Vastra Esplanadgatan 5 2, Sundsvall, Sweden, do hereby declare this invention for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates generally to electrical fuses and more particularly to a device for removably mounting fuses in a protective housing having safety means for ensuring their safe disconnection and removal.

A combined electric fuse carrier and contact breaker according to the invention comprises a stationary contact fork arranged to grip one contact tongue of a cartridge fuse, a guide disposed with relation to the contact for receiving a second contact tongue of the cartridge fuse when the fuse is in its working position, a switch arm comprising a U-shaped member of dielectric material, the free ends of which are adapted to swivel about a transverse shaft, and a contact fork carried by the switch arm and adapted to make contact with the said second contact tongue of the fuse, when the switch arm is in the closed position.

The invention provides an improved means for carrying cartridge fuses having means for mounting a cartridge type fuse in a stationary position irrespective of the associated contact breaker.

The invention also provides a contact breaker for use with the fuse carrier wherein only two contact surfaces are involved in the making and breaking of the circuit through the fuse.

Means are embodied to provide safe and expeditious replacement of burned-out fuses to promote safety of operating personnel.

The improved combined fuse carrier and

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contact breaker is arranged in a compact and unified manner and capable of economical manufacture.

The invention will be described in detail with reference to the accompanying drawings 50 in which:—

Fig. 1 is a side elevational view, in partial section, of a combined fuse carrier and contact breaker device according to one embodiment of the invention;

Fig. 2 is a top plan view in partial section of the device shown in Fig. 1; and

Fig. 3 is a front elevational view, in partial section, of the new and improved fuse carrier and disconnecting device shown in Fig. 1.

Fig. 1 shows a base plate 1 having backwardly bent side flanges 2 for supporting three sockets 4 made of steatite or some other suitable dielectric material which are fastened on the base plate 1 by bolts 3. Each of the sockets 4 is provided at its lower end with an electrically conductive contact fork 5. The lower end of each contact fork 5 is suitably provided with a connecting screw 6 to which a conductor wire (not shown) is to be fastened. Each socket 4 is further provided adjacent its upper end with an L-shaped bracket 7, one arm 8 of which is connected to its associated dielectric socket 4. A second, transversely extending arm 9 of each bracket 7 is provided with a central slotted opening 10 formed inwardly from the leading edge of the bracket arm 9. Each slot 10 is formed in such a manner and each bracket 7 is placed at such a position and distance from its related contact fork 5 that a conventional fuse cartridge 11 may be placed in operative position therebetween so that a lower contact tongue 12 of the cartridge will be squeezed or embraced by the contact fork 5 and an upper contact tongue 13 of the cartridge will be guided and embraced in slot 10, substantially as illustrated in Fig. 3 of the drawings.

Disposed transversely between and pro-

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jecting through the flange portions 2 of the base plate 1, adjacent the upper end thereof, is a shaft 14. The free ends of shaft 14 are connected with a U-shaped switch arm 15 made of dielectric material mounted outwardly of the flange portions 2, substantially as shown in Fig. 2 of the drawings. Switch arm 15 is adapted to swivel when shaft 14 is rotated by means of an operating handle or the like (not shown) associated with an arm 16 and a link 17, the latter of which is rigidly connected to the arm 15 at its right hand end, as illustrated in Fig. 3 of the drawings. The arm 15 further comprises a pair of parallel bars 18 formulated at its front end or forming the base portion of its U configuration. The bars 18 support three contact forks 20, of electrically conductive material, which are fastened to the arms 18 by bolts 19 and depend in parallel spaced position beneath arms 18, substantially as shown in Fig. 3 of the drawings.

It will further be noted that the several contact forks 20 are located in the same vertical plane and are spaced according to the lateral spacing of the stationary forks 5 and bracket slots 10 described heretofore. The arms of forks 20 are further aligned to receive the upper contact tongues 13 of the cartridge fuses therebetween and thus are vertically aligned with slots 10 of the brackets 7.

A protective casing or covering for the carrier, having the same dimensions with the base plate 1, is mounted outside the arm 15 and connected thereto by means of bolts or screws 21, substantially as illustrated. For sake of convenience, it is preferred that the protective case 22 be made of a transparent dielectric material so that the operation of the fuses may be observed without removal of the cover or casing. The protective case comprises a front wall 23, two side walls 24, 24 and a pair of spark guard partitions 25 located for passage intermediate the middle and end disposed socket members 4 of the carrier assembly. The purpose of the casing, of course, is to enclose the current carrying parts of the device illustrated and such is adapted for hinging or arcuate movement with the arm 15 as shown by the dotted lines of Fig. 1.

OPERATION

With cartridge type fuses 11 positioned as shown in Fig. 3 of the drawings so that the lower tongues 12 thereof are grasped or clamped by the lower stationary forks 5 and the upper tongue members 13 thereof are located in the slotted apertures 10 of brackets 7, disconnection of the circuit through the fuses is accomplished by swinging switch arm 15 to its upper or "off" position, illustrated by the dotted line showing of Fig. 1. When this occurs the fuses 11 are maintained in their positions on the carrier sockets 4 by

means of the gripping action of the lower forks 5 and the slotted angle brackets 7. The contact forks 20, of course, move with the cover 22 and the arm 15 and are thus swung upwardly away from the fuses to break circuit connection therewith. The forks 20 of course are the live forks of the switching system and are provided with current by means of conductor wires 26, or the like, as shown in Fig. 1. Since the cover 22 interferes with the extension of the operator's hand to engage the forks 20 and also separates the lower forks 5 from the forks 20, by carrying the latter with it to its upwardly swung position, the device of the invention thus provides a safety factor giving it distinct advantage over prior art devices of this character. The exchange of fuse cartridges 11 for new ones may be carried out without risk to the operator since at the breaking of circuit there-through by swinging the live forks 20 to their upward or "off" switch position the lower forks 5 are thereby de-energised or disconnected from the circuit and are thus "dead." The insulated relation of the guiding bracket 7 further enhances the "dead" condition of the cartridge fuse member 11. When the cover and upper forks 20 are swung downwardly to close the circuit again, the contact forks swing with the cover to embrace the upper tongues 13 of the cartridge fuses and push the same tightly against the rearward side of the slotted apertures 10 formed in bracket arms 9. Thus the fuse cartridges are held steadily in their working position in the fuse carrier and good contact is obtained between the upper contact tongues 13 and the live upper contact forks 20.

The advantage of constructing the casing 22 of a transparent dielectric material will be appreciated especially since it gives the operator a view of the position of the forks 20 during the changing of a burned-out fuse. Further, it will be appreciated that the front wall portion 23 of the casing or cover 22 provides a shield to prevent the introduction of the operator's hand to the live contact forks 20 and thus prevent him from completing the circuit across the upper and lower contact forks 20 and 5, respectively, through the intermediary of his hand.

The embodiment shown and described herein is to be considered only as one example of how the features of the present invention may be embodied in a workable device and it will be understood that various modifications of the combined fuse carrier and contact breaker may be within the scope of the invention. For example, it may be convenient to have the upper contact forks 20 movable vertically or at an angle relative to the upper contact tongues 13 of the fuse cartridges 11. Such a change may be carried out without departing from the invention and

therefore this change is contemplated as one modified form of the invention which may be carried out with marked advantage in certain situations and conditions. Likewise, in order to prevent the dislodging of the fuses during the disconnecting movement of the contact forks 20 from the tongues 13 of the cartridge fuses 11, it may be desired to embody a different style of aperture in the platform portion 9 of brackets 7 and to that end it is contemplated that the aperture 10 may be enclosed at its forward end, such as is indicated by dotted lines 30 in Fig. 2 of the drawings.

Further, the invention may be applied to one, two or multiple units as desired and springs or the like may be utilised with the cover to provide a quick disconnection of the forks 20 and the tongue portions 13 of the cartridge fuses 11.

What we claim is:—

1. A combined electric fuse carrier and contact breaker which comprises a stationary contact fork arranged to grip one contact tongue of a cartridge fuse, a guide disposed with relation to the contact for receiving a second contact tongue of the cartridge fuse when the fuse is in its working position, a switch arm comprising a U-shaped member of dielectric material, the free ends of which are adapted to swivel about a transverse

shaft, and a contact fork carried by the switch arm and adapted to make contact with the said second contact tongue of the fuse, when the switch arm is in the closed position.

2. A combined electric fuse carrier and contact breaker according to Claim 1 in which the said guide comprises a plate of L-shape, one arm of which serves as a fastening plate and the other arm of which is provided with a slotted opening formed within a leading edge thereof, such slotted opening being arranged for receiving a second contact tongue of the cartridge fuse.

3. A combined electric fuse carrier and contact breaker according to Claim 1 or Claim 2 in which a casing of dielectric material is arranged outside the switch arm and enclosing the said second contact fork, the casing being arcuately movable with the switch arm and the said second contact fork and shielding the said second contact fork from manual engagement.

4. A combined electric fuse carrier and contact breaker substantially as described herein with reference to the accompanying drawings.

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Printed for Her Majesty's Stationery Office by Wickes & Andrews, Ltd., E.C.4. 39/244.—1954.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies may be obtained.

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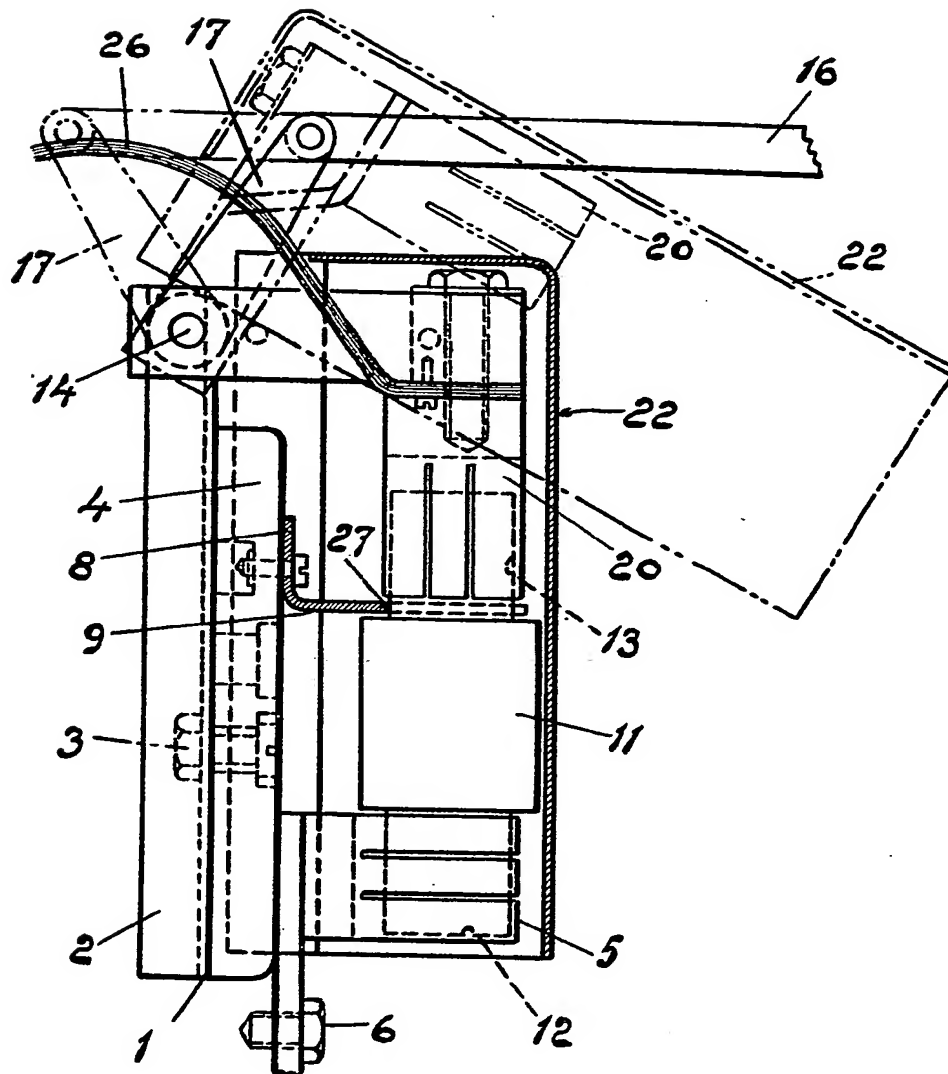
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2 SHEETS

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SHEET 1

Fig. 1



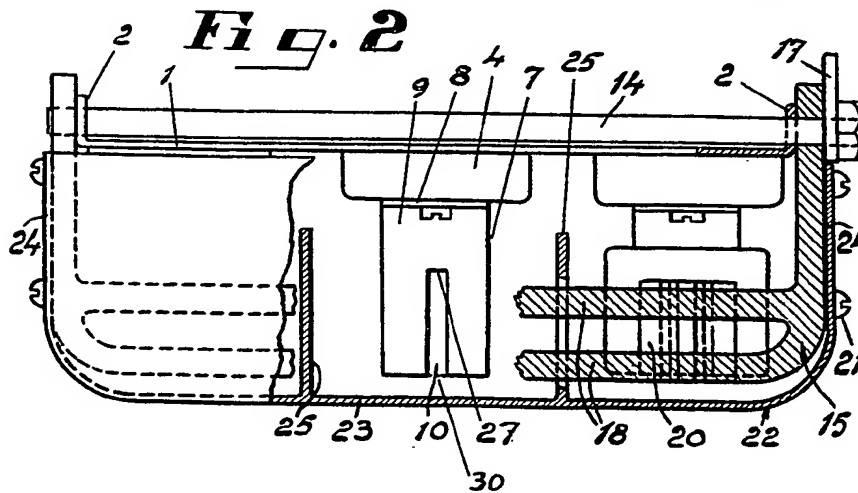
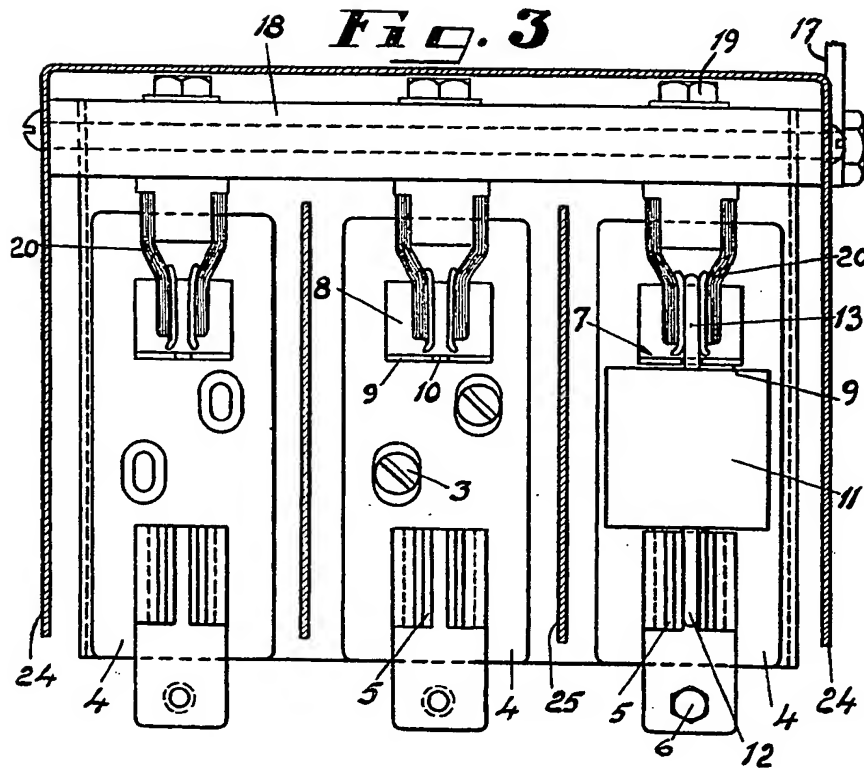
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SHEET 2



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